

In the Claims

1 (Currently amended): In a data processing system for connection in an open system network including a data storage facility and a host device for generating commands during the processing of a host application including a first command to copy data with arguments identifying a source logical device and a destination logical device and a second command, wherein the data storage facility includes a host controller for receiving the commands, device controllers associated with each of said source and destination logical devices and means for interconnecting said controllers, a said method for responding to the first and second commands comprising the steps in sequence of:

- A) establishing, in response to the first command, in the data storage facility an operating environment by generating a data structure including identifying, in response to arguments, the addresses of the source and destination logical devices, an operation data element for identifying the establishment and an operation status element designating the status of said establishment step and data about each storage location in the source and destination logical devices,
- B) making the source and destination logical devices available for use by host applications, and
- C) initiating copying, in response to the second command and in response to the operation data and status

elements indicating that the establishment has been completed, an ordered copying of data from the source logical device to the destination storage locations in an ordered manner logical device including updating the operation data and status elements to indicate that copying is in progress and, for each storage location in the source logical device:

- i) copying the data from each storage location in the identified source logical device to the identified destination logical device, and
- ii) updating the information in the operating environment data for each storage device to indicate the completion of each transfer from a storage location in the source logical device, and

D) upon completion of said copying, updating the operation status element to indicate that the copying has been completed.

2 (Original): A method as recited in claim 1 additionally comprising the step of deleting the operating environment after said copying has been completed for all the data in the source logical device.

3 (Original): A method as recited in claim 2 wherein during said copying a host application generates as one command a write request to transfer data from the host application to an

identified storage location in the source logical device, said method including the steps of:

- i) interrupting said ordered copying in response to the request,
- ii) copying data existing in the identified storage location in the source logical device to a corresponding storage location in the destination logical device,
- iii) re-enabling said ordered copying upon completion of said data copying, and
- iv) completing the data transfer to the identified storage location in the source logical device in response to the write request.

4 (Original): A method as recited in claim 2 wherein during said copying a host application generates as one command one of read and write requests to transfer data between the host application and an identified storage location in the destination logical device, said method including the steps of:

- i) interrupting said ordered copying in response to the request,
- ii) copying data to the identified storage location in the destination logical device from a corresponding storage location in the source logical device,
- iii) re-enabling said ordered copying upon completion of said data copying, and

iv) completing the transfer between the host application and the identified storage location in the destination logical device.

5 (Currently amended): In a data processing system for connection in an open system network including a data storage facility and a host device for generating commands during the processing of a host application including a first command to establish an operating environment for copying and a second command to copy the data from a source logical device comprising a plurality of contiguous data tracks on a physical disk storage device to a block of contiguous data tracks in a destination logical device wherein said source and logical device are components of the data storage facility that additionally includes a host controller for receiving the commands and a device controller associated with each of said source and destination logical devices, said a method for responding to the first and second commands comprising the steps in sequence of:

A) establishing, in the data storage facility and in response to the first command, an operating environment by identifying, generating, in response to arguments in the first command, initial locations for that identify the source and destination logical devices, an operation data element for identifying the establishment and an operation status element designation the status of said establishment step and

data about each storage location in the source and destination logical devices

- B) making the data in the source and destination logical devices available for use by host applications, and
- C) copying initiating, in response to the second command when the operation data and status elements indicate that the establishment has been completed, an ordered copying of the data from the source logical device to the destination logical device on an ordered, a track-by-track basis including, and for each data track in the source logical device:
 - i) copying the data in a data track in the source logical device to a corresponding data track in the destination logical device, and
 - ii) updating the information in the operating environment data for each storage device to indicate the completion of each transfer from the source logical device, and
- D) upon completion of said copying, updating the operation data and status elements to indicate that the copying has been completed.

6 (Original): A method as recited in claim 5 additionally comprising the step of deleting the operating environment after said copying has been completed for all the data tracks in the source logical device.

7 (Original): A method as recited in claim 6 wherein during said ordered copying a host application generates as another command a write request to transfer data to at least a portion of an identified data storage track in the source logical device, said method including the steps of:

- i) interrupting said ordered copying in response to the write request,
- ii) copying data existing in the identified data track in the source logical device to a corresponding track in the destination logical device,
- iii) re-enabling said ordered copying upon completion of said data copying, and
- iv) completing the transfer of data associated with the write request to the identified data track in the source logical device.

8 (Original): A method as recited in claim 6 wherein during said ordered copying a host application generates as one command one of read and write requests to transfer data between the host application and at least a portion of an identified track in the destination logical device, said method including the steps of:

- i) interrupting said ordered copying in response to the request,
- ii) copying data to the identified data track in the destination storage location from a

corresponding data track in the source logical device,

- iii) re-enabling said ordered copying upon completion of said data copying, and
- iv) completing the transfer between the host application and the identified data track in the destination logical device.

9 (Currently amended): A data storage facility that connects to a host device that generates commands during the processing of host applications wherein said data storage facility is adapted for copying data from a source logical device to a destination logical device in response to a predetermined first and second commands ~~command~~ from a host application identifying said source and destination logical devices and wherein said data storage facility includes a host controller for receiving the commands and a device controller for each logical device, said facility comprising:

- A) means responsive to the first predetermined command for establishing an operating environment by identifying said source and destination logical devices, said means including a copy data structure that identifies the source and destination devices and operation and operation status data elements that collectively identify an operating phase and state thereof as an establishment phase in progress and means for indicating the status of the copying in each of the source and destination logical devices,

- B) means for enabling interaction of other commands with said source and destination logical devices, and
- C) copy means, responsive to the second predetermined command when said operation and operation status data elements indicate the establishment phase is complete, for initiating the copying the data from said source logical device to said destination logical device in an ordered manner and updating the operating phase to indicate that copying is in progress, and
- D) means responsive to said copying means for updating the copying status operating environment to indicate data that has been transferred by said copying means, and
- E) means for updating the operating status to indicate the copying has been completed.

10 (Original): A data storage facility as recited in claim 9 additionally comprising means for deleting the operating environment after said copying means has been completed copying all the data in said source logical device.

11 (Original): A data storage facility as recited in claim 10 wherein during the ordered copying a host application generates as another command a write request to transfer data from the host application to an identified storage location in said source logical device, said copying means including:

- i) a copy program,

- ii) means for operating said copy program in the ordered copying mode,
- iii) means for interrupting said ordered copying operating means in response to a write request and enabling said copy program to copy data from said identified storage location in said source logical device to a corresponding storage location in said destination logical device,
- iv) means for re-enabling said ordered copying upon completion of said data copying, and
- v) means for completing the data transfer to said identified storage location in said source logical device in response to the write request.

12 (Original): A data storage facility as recited in claim 10 wherein during said ordered copying a host application generates as one command one of read and write requests to transfer data between the host application and an identified location in said destination logical device, said ordered copying means including:

- i) a copy program,
- ii) means for operating said copy program in the ordered copying mode,
- iii) means for interrupting said ordered copying operating means in response to any read and write request to a storage location in said destination logical device to enable said copy program to copy data from a corresponding

storage location in said source logical device to the identified storage location in the destination logical device,

- iv) means for re-enabling said ordered copying operating means upon completion of said data copying, and
- v) means for completing the transfer between the host application and said identified storage location in said destination logical device.

13 (Currently amended): A data storage facility including logical storage devices, a first controller for receiving commands from a host and a device controller associated with each logical device, said data storage facility being adapted for connection in an open system network including wherein the a-host device that generates commands during the processing of host applications, which commands include is adapted to generate a first command for establishing an operating environment for copying and a second command for initiating the copying of data, said first command including with arguments identifying source and destination logical devices wherein each said logical device stores data in contiguous data tracks, said facility comprising:

- A) establishment means in the data storage facility responsive to the the first copying command for establishing an operating environment by in response to the command and the arguments that generating initial locations for identify said source and

destination logical devices, an operation data element and operation status element that initially indicate an establishment phase in progress, and data about each data track in the source and destination logical devices,

- B) means for enabling interaction of other commands with said source and destination logical devices, and
- C) copying means for initiating, in response to the second command when the operation data and status elements indicate the establishment phase has been completed, an ordered copying the data from said source logical device to said destination logical device in an ordered, a track-by-track, manner, and
- D) updating means responsive to said copying means for updating the data about each data track operating environment to indicate the complete of during each transfer of data in a data track, and
- E) means responsive to the completion of the copying for updating the operating data and status elements to to indicate the completed state of the copying.

14 (Original): A data storage facility as recited in claim 13 additionally comprising means for deleting the operating environment after said copying means has been completed copying all the data in said source logical device.

15 (Original): A data storage facility as recited in claim 14 wherein during said ordered copying a host application

generates as one command a write request to transfer data from the host application to an identified data track in said source logical device, said copying means including:

- i) a copy program,
- ii) means for operating said copy program in the ordered, track-by-track manner,
- iii) means for interrupting said ordered copying operating means in response to the write request and enabling said copy program to copy data in said identified data track in said source logical device to a corresponding data track in said destination logical device,
- iv) means for re-enabling said ordered copying upon completion of said data copying, and
- v) means for completing the transfer of data associated with the write request to said identified data track in said source logical device.

16 (Original): A data storage facility as recited in claim 14 wherein during said ordered copying a host application generates as another command one of read and write requests to transfer data between the host application and an identified data track in said destination logical device, said ordered copying means including:

- i) a copy program,
- ii) means for operating said copy program in the ordered, track-by-track, manner,

- iii) means for interrupting said ordered copying in response to one of the read and write requests to a data track in said destination logical device thereby to enable said copy program to copy the data in said corresponding data track of said source logical device to said identified data track in said destination logical device,
- iv) means for re-enabling said ordered copying upon completion of said data copying, and
- v) means for completing the transfer between the host application and said identified data track in said destination logical device, and
- vi) means for completing the transfer between the host application and the identified destination storage location.